FIG. 1

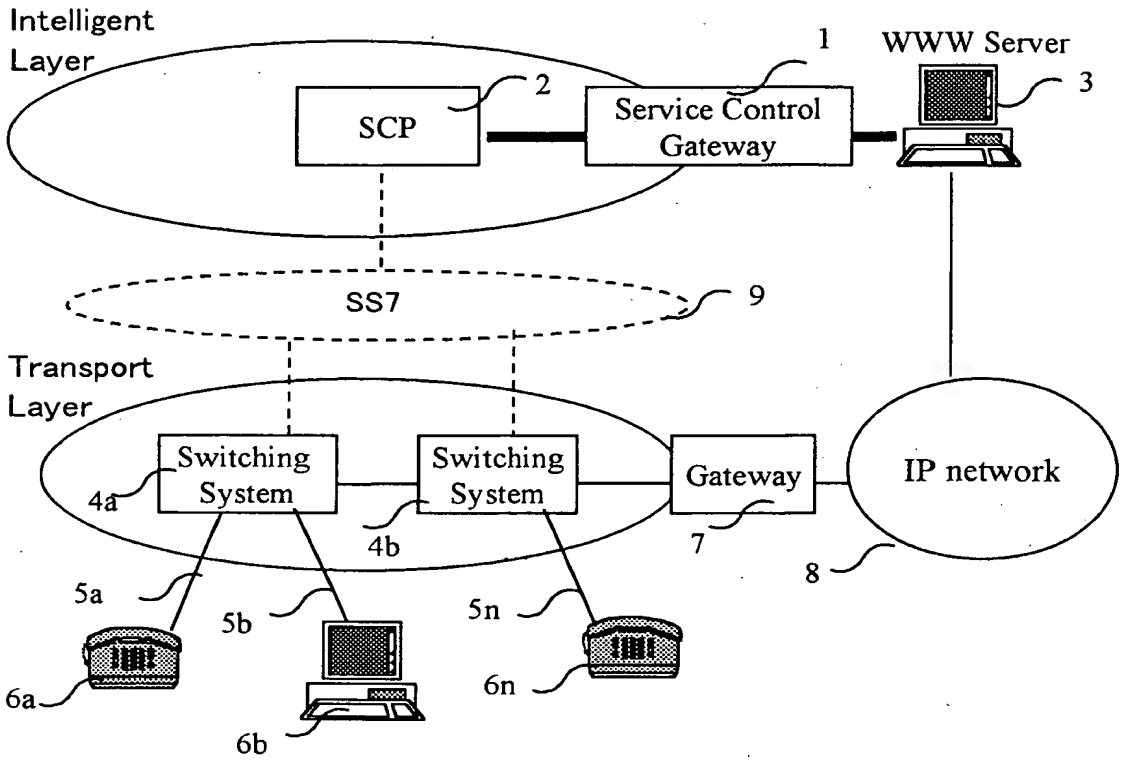

Intelligent Layer
1
WWW Server
2
SCP
Service Control Gateway
3
SS7
9
Transport Layer
Switching System
4a
Switching System
4b
Gateway
7
IP network
8
5a
5b
5n
6a
6b
6n

FIG. 2

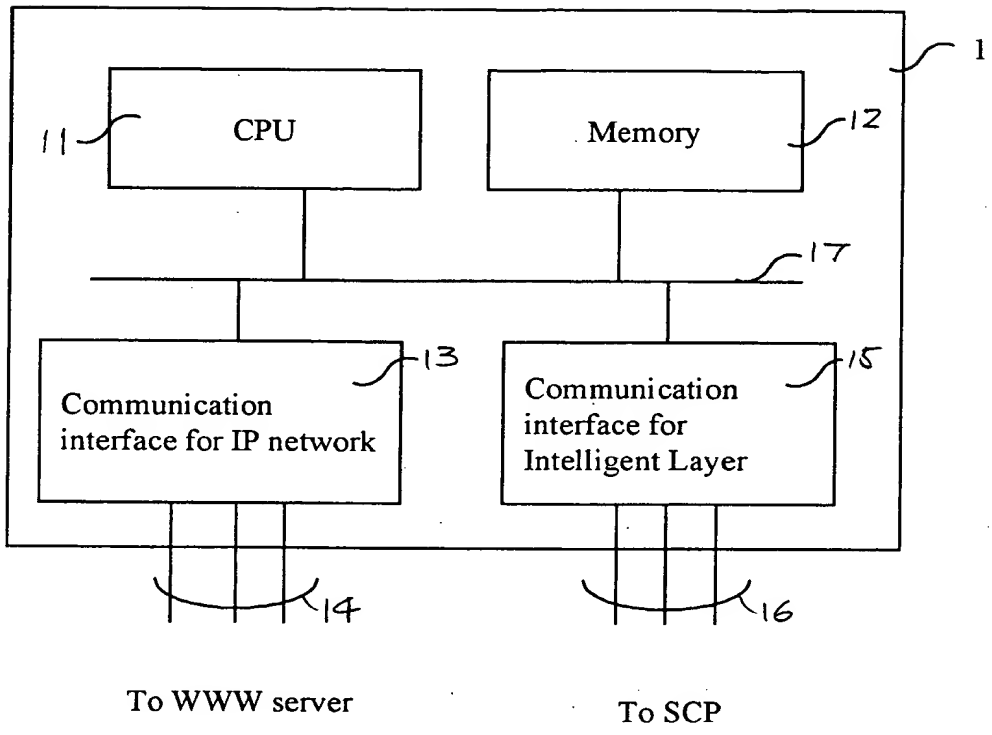

1
CPU
11
Memory
12
17
Communication interface for IP network
13
Communication interface for Intelligent Layer
15
14
16
To WWW server
To SCP

FIG. 3A SCP Address Management Table 400

Type of Message	Network ID	SCP ID	Service No.
"IN Service Request"	...	...	I-X
"Notification Response"	...	...	I-X

401 402 403 404

FIG. 3B User Management Table 410

User ID	TEL No.	Correlation ID-1	Correlation ID-2	WWW Server Address	State	URL

411 412 413 414 415 416 417

FIG. 4A Request Management Table 430

Type of Message	Service Program No.

431 432

FIG. 4B Service Management Table 440

Service Program No.	SCGW Address	Network ID	Service No.	URL

441 442 443 444 445

FIG. 4C User State Management Table 450

User ID	State	Correlation ID

451 452 453

FIG.5A Service Decision Table 460

Trigger	Number Information	Service Key	Service No.	Service Program No.	
α	0120	—	—	100	460-1
β	—	Q	—	500	460-2
—	—	—	I-X	600	460-3
⋮				⋮	
461	462	463	464	465	

FIG.5B User Information Pointer Address Table 470

Service Program No.	Telephone No.	Pointer Address	
500	0423231111	XX	470-1
500	0426210110	XY	470-2
600	0423231111	XX	470-3
⋮			
471	472	473	

FIG.5C User Information Management Table 480

Address	User ID	Telephone No.	IP Access Flag	SCGW Address	Correlation ID-1
XX	AA	0423231111	1	XXX···XX	ZZZZ
XY	BB	0426210110	0	—	—
481	482	483	484	485	486

FIG. 6

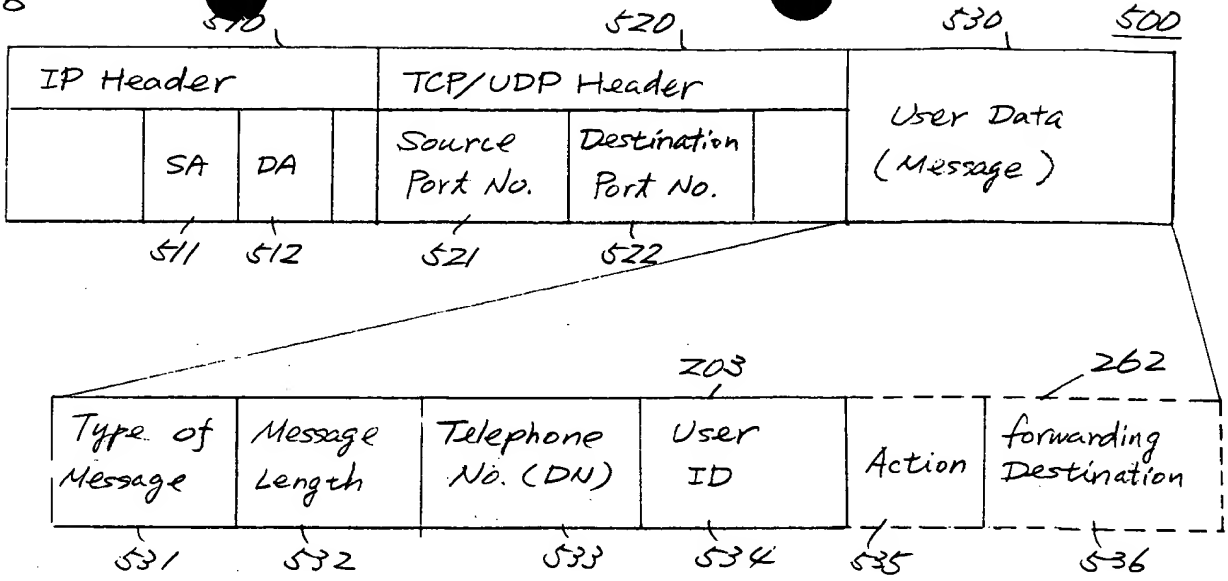


FIG. 7

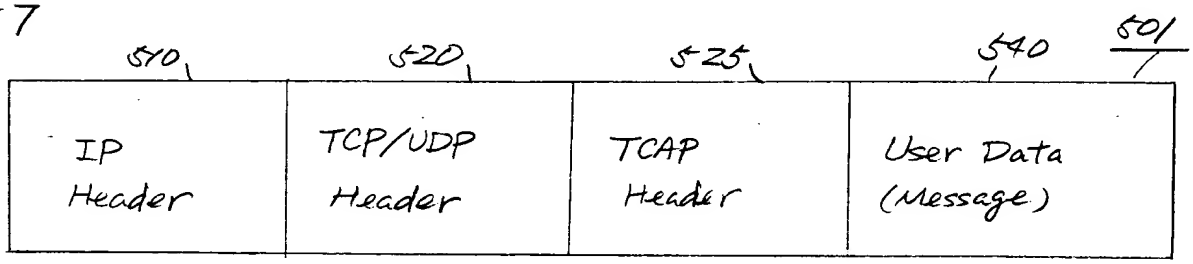


FIG. 8A

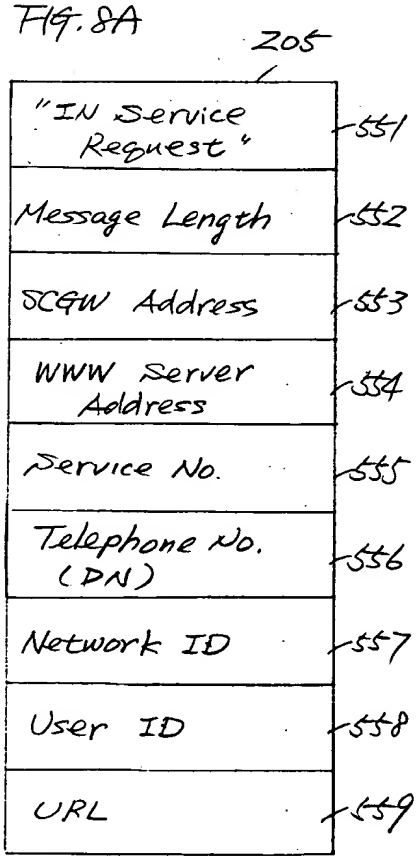


FIG. 8B

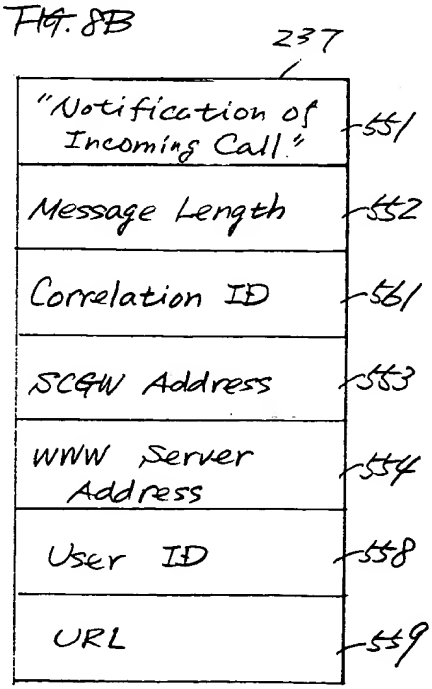


FIG. 8C

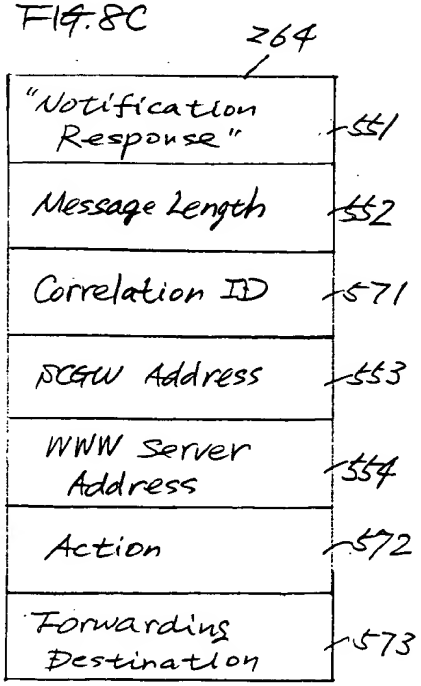


FIG. 9

800

Destination Point Code	Originating Point Code	Signalling Link Selection	SCCP Header	TCAP Header	User Data (Message)
801	802	803	804	805	810

FIG. 10A

216

"IN Service Request"	821
Message Length	822
Correlation ID	823
Source SCGW Address	824
Destination SCP Address	825
Service No.	826
Telephone No. (DN)	827
User ID	828

FIG. 10B

235

"Notification of Incoming Call"	821
Message Length	822
Correlation ID	823
Destination SCGW Address	831
Source SCP Address	832
Telephone No. (DN)	827
User ID	833

FIG. 10C

265

"Notification Response	821
Message Length	822
Correlation ID	823
Source SCGW Address	824
Destination SCP Address	825
Action	841
Forwarding Destination	842

FIG. 11

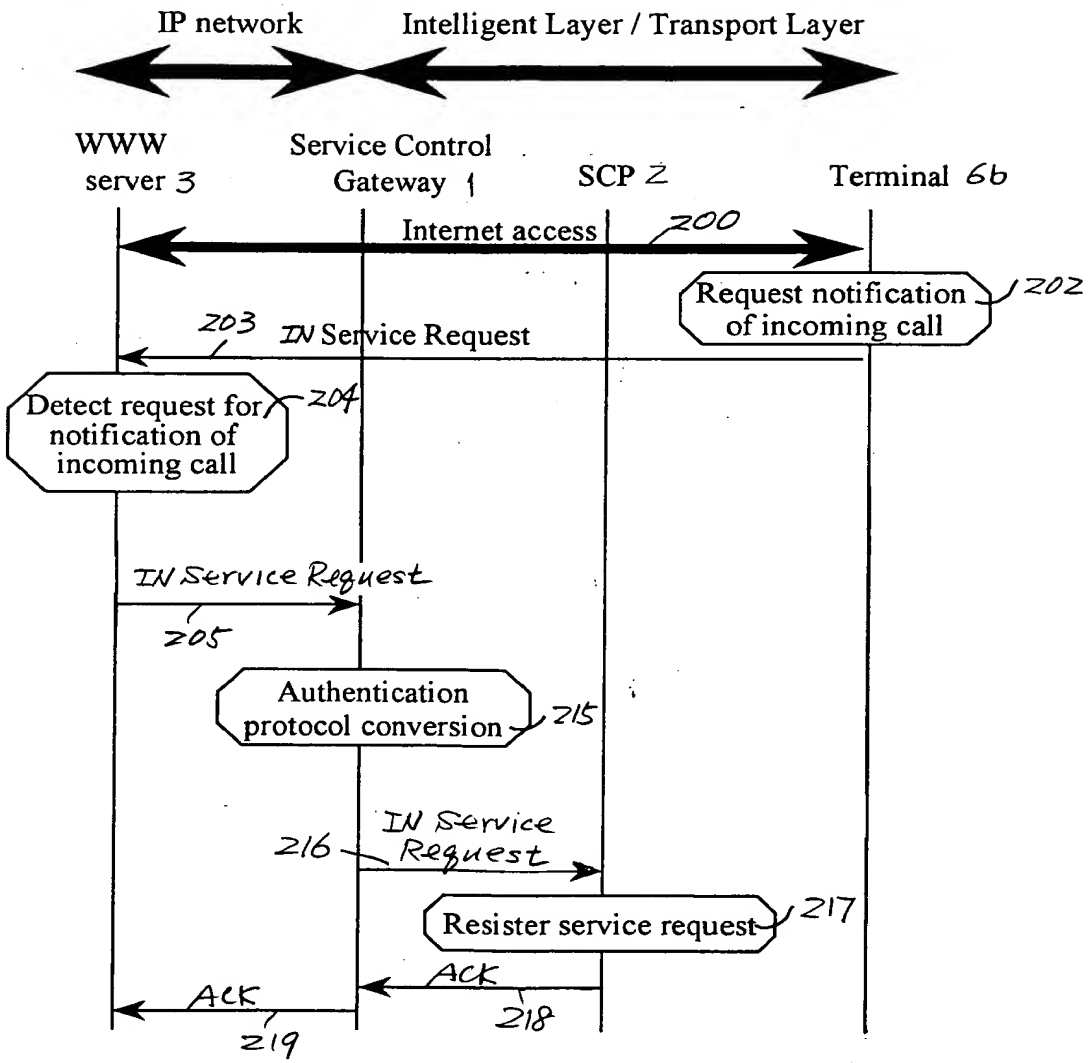

IP network
Intelligent Layer / Transport Layer
WWW server 3
Service Control Gateway 1
SCP 2
Terminal 6b
Internet access
200
Request notification of incoming call
202
203
IN Service Request
Detect request for notification of incoming call
204
IN Service Request
205
Authentication protocol conversion
215
IN Service Request
216
Resister service request
217
ACK
218
ACK
219

FIG. 12

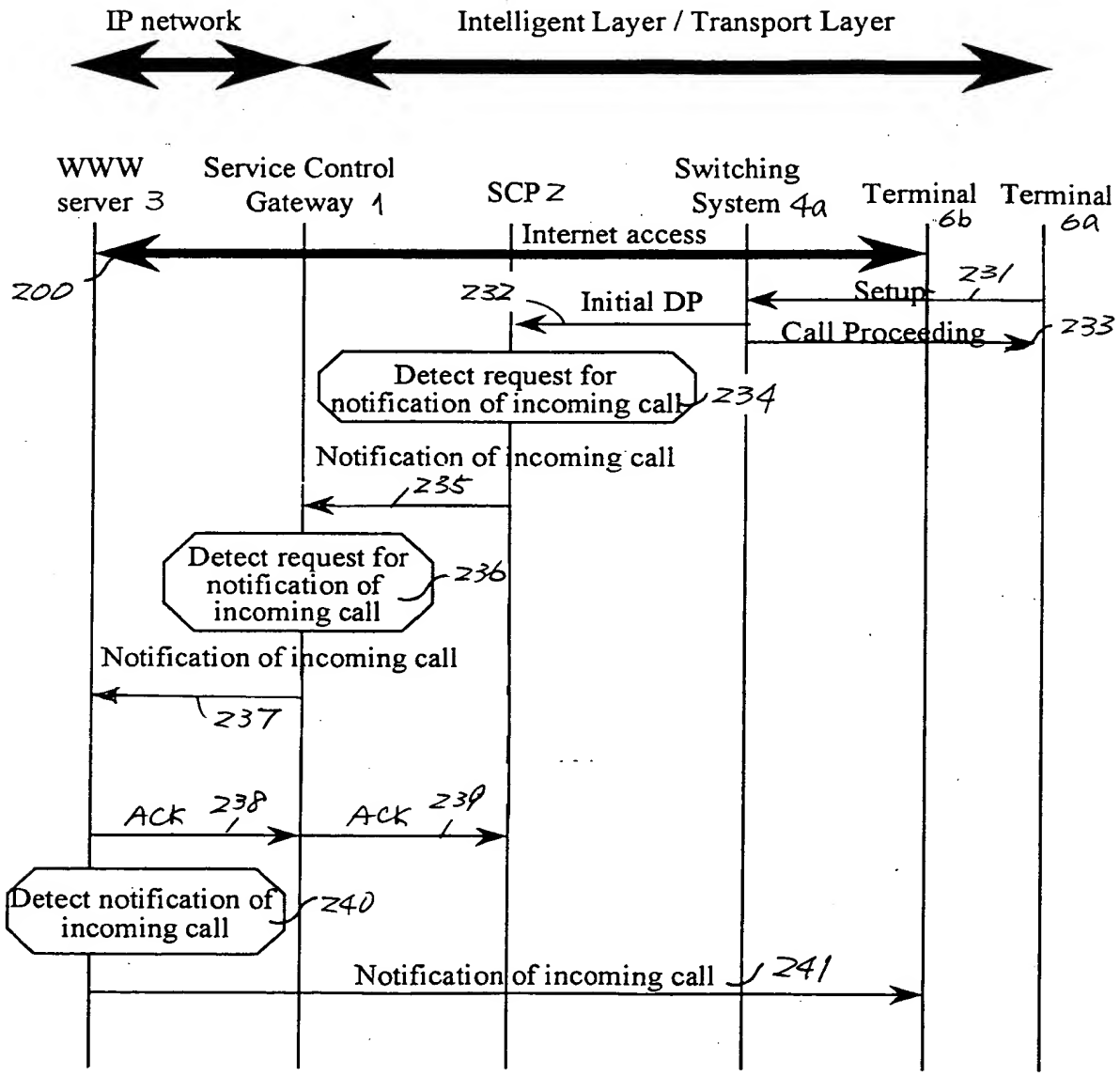

IP network
Intelligent Layer / Transport Layer
WWW server 3
Service Control Gateway 1
SCP 2
Switching System 4a
Terminal 6b
Terminal 6a
Internet access
200
232
Initial DP
231
Setup
Call Proceeding
233
Detect request for notification of incoming call
234
Notification of incoming call
235
Detect request for notification of incoming call
236
Notification of incoming call
237
ACK
238
ACK
239
Detect notification of incoming call
240
Notification of incoming call
241

FIG. 13

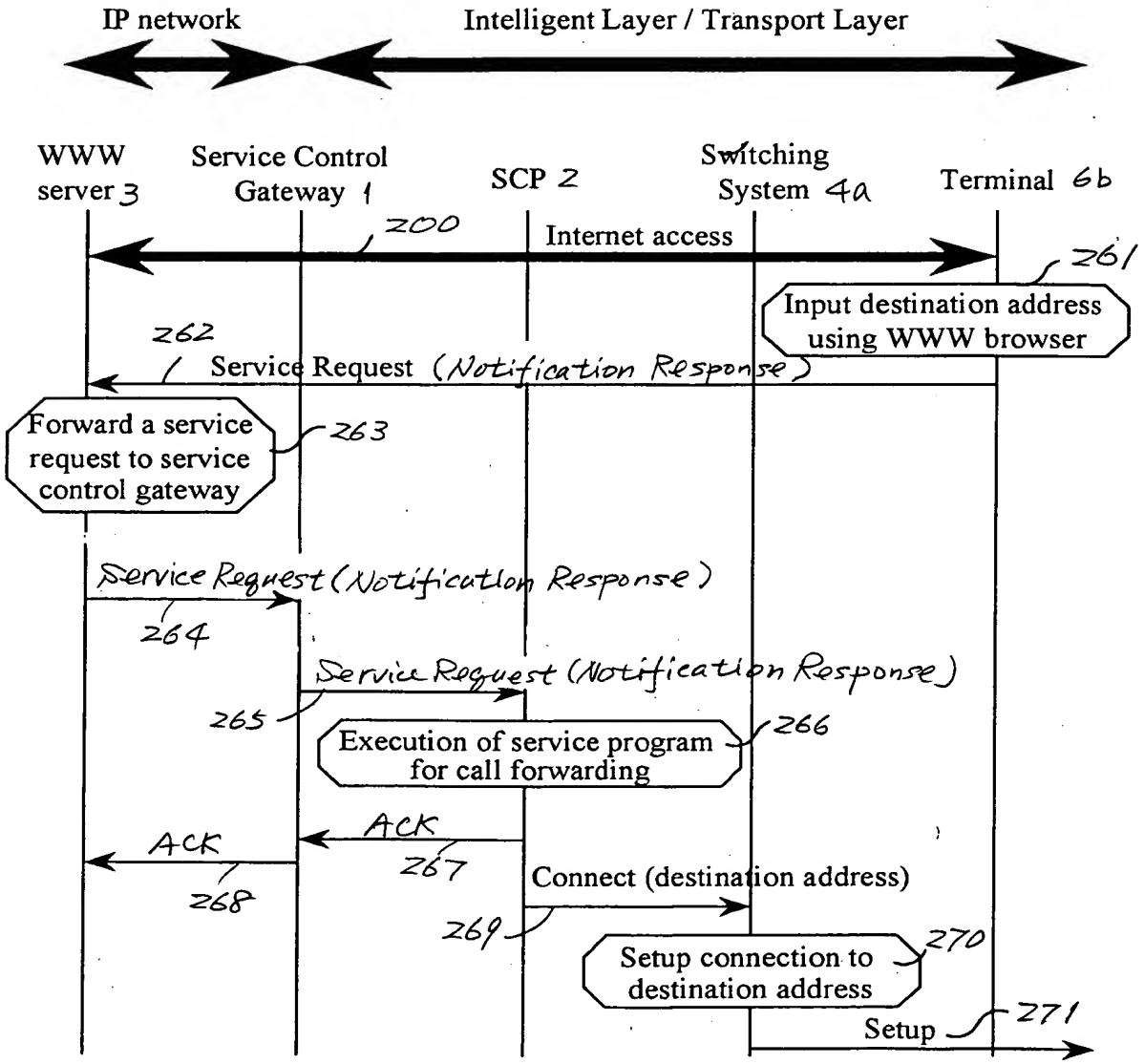

IP network
Intelligent Layer / Transport Layer
WWW server 3
Service Control Gateway 1
SCP 2
Switching System 4a
Terminal 6b
200
Internet access
261
Input destination address using WWW browser
262
Service Request (Notification Response)
Forward a service request to service control gateway
263
Service Request (Notification Response)
264
Service Request (Notification Response)
265
Execution of service program for call forwarding
266
ACK
267
ACK
268
Connect (destination address)
269
Setup connection to destination address
270
Setup
271

FIG. 14

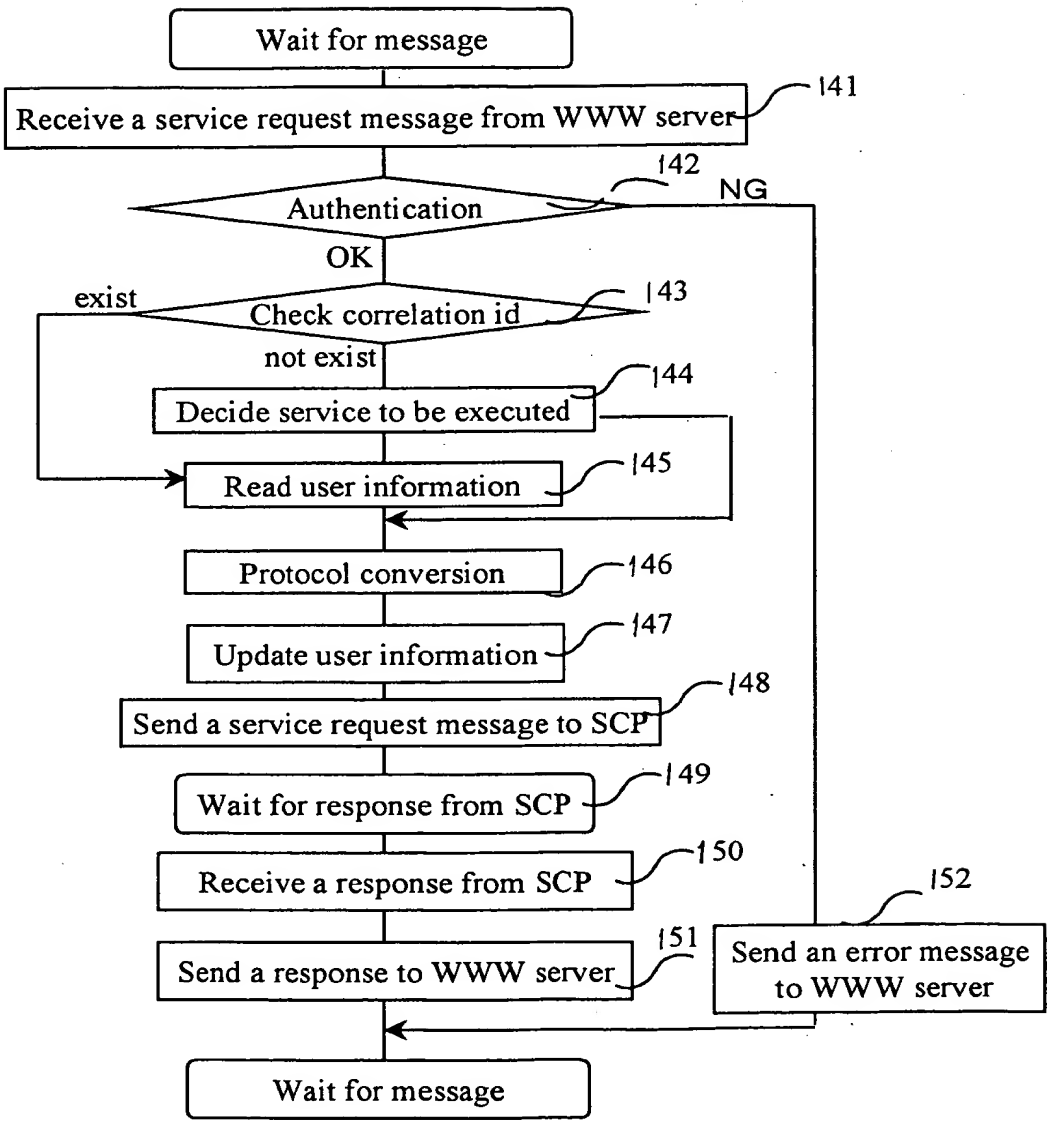

Wait for message
Receive a service request message from WWW server
141
Authentication
142
NG
OK
exist
Check correlation id
143
not exist
Decide service to be executed
144
Read user information
145
Protocol conversion
146
Update user information
147
Send a service request message to SCP
148
Wait for response from SCP
149
Receive a response from SCP
150
Send a response to WWW server
151
Send an error message to WWW server
152
Wait for message

FIG. 15

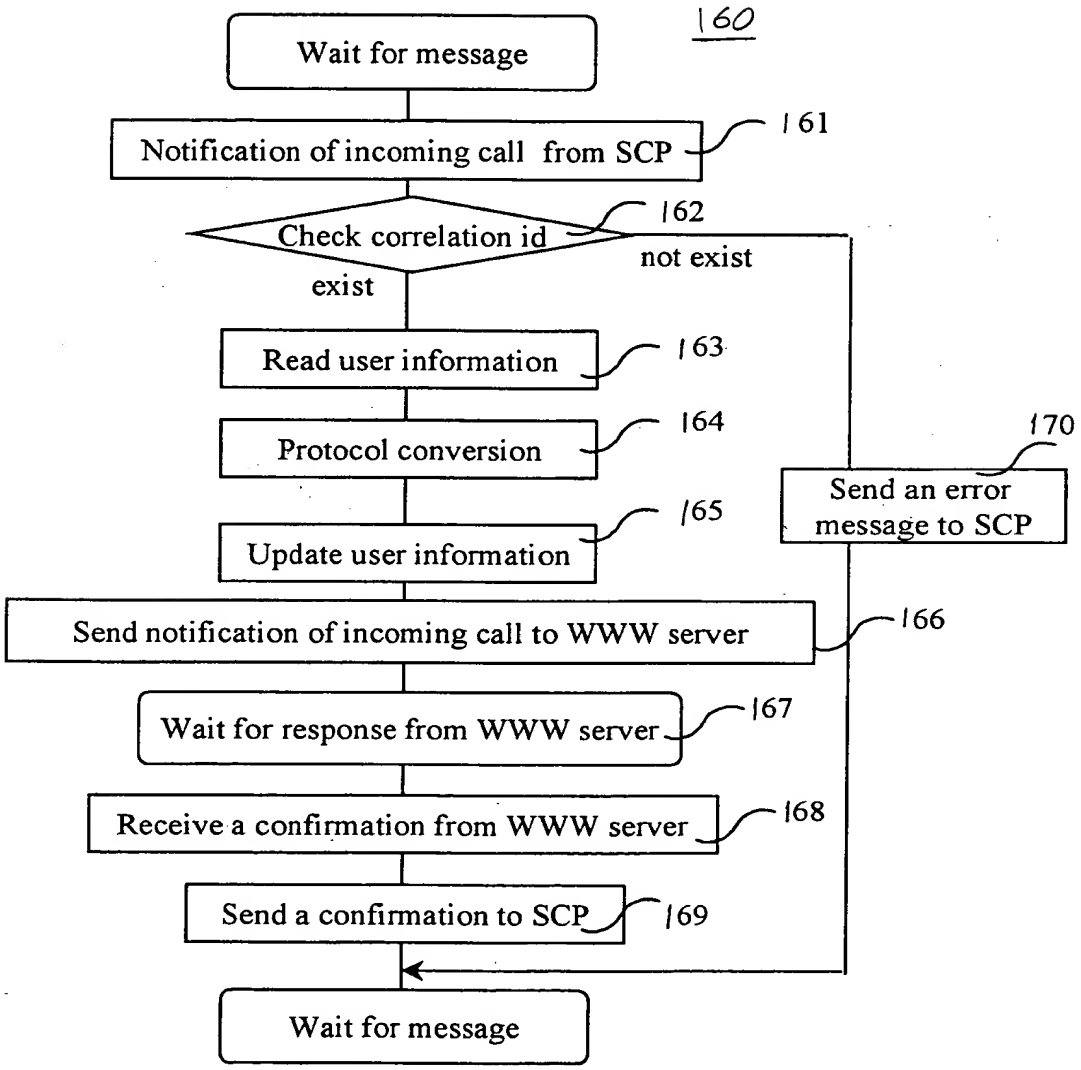

160
Wait for message
Notification of incoming call from SCP
161
Check correlation id
162
not exist
exist
Read user information
163
Protocol conversion
164
170
Send an error message to SCP
Update user information
165
Send notification of incoming call to WWW server
166
Wait for response from WWW server
167
Receive a confirmation from WWW server
168
Send a confirmation to SCP
169
Wait for message

FIG. 16

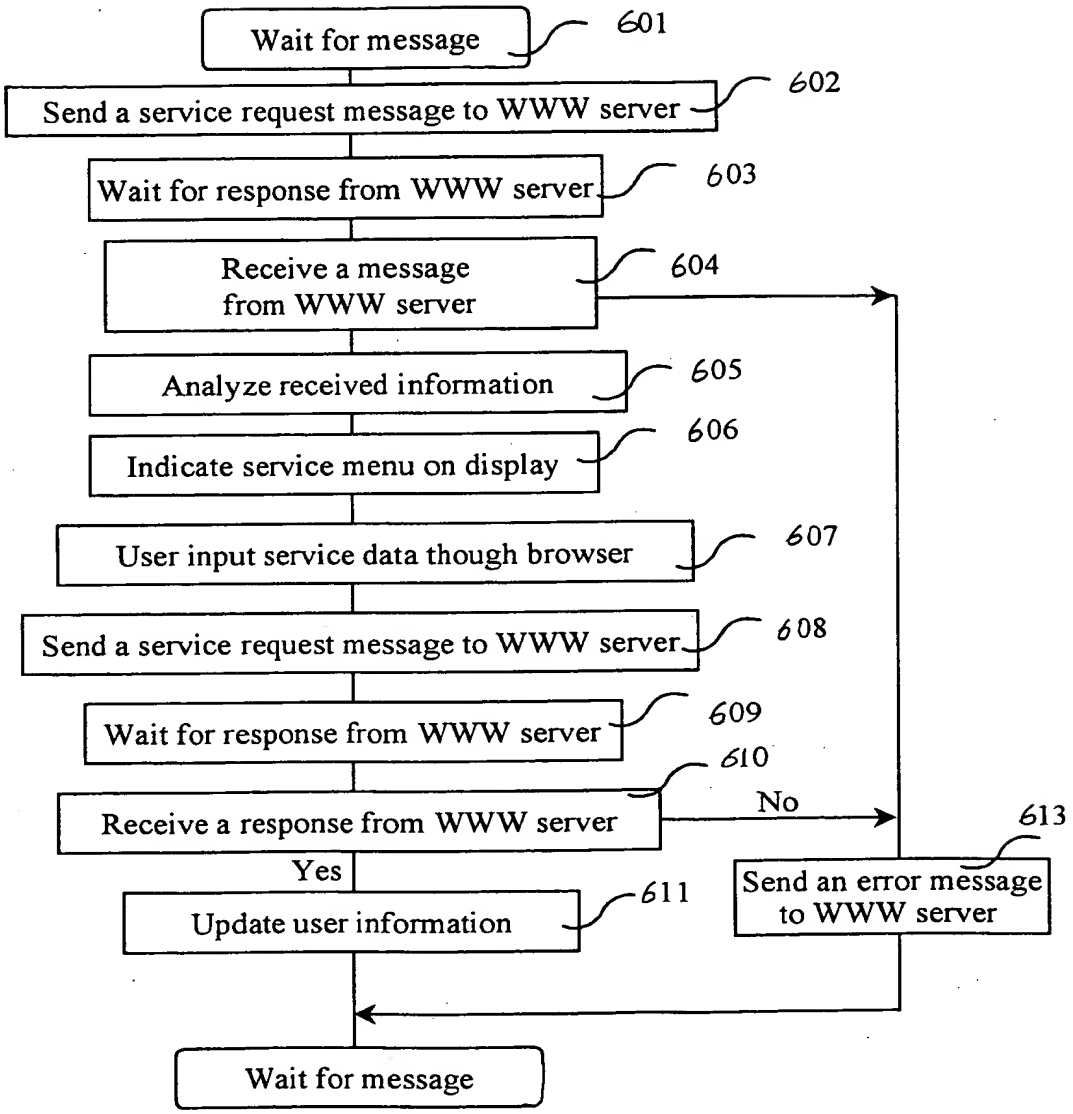

Wait for message
601
Send a service request message to WWW server
602
Wait for response from WWW server
603
Receive a message from WWW server
604
Analyze received information
605
Indicate service menu on display
606
User input service data though browser
607
Send a service request message to WWW server
608
Wait for response from WWW server
609
Receive a response from WWW server
610
No
Yes
Update user information
611
Send an error message to WWW server
613
Wait for message

FIG. 17

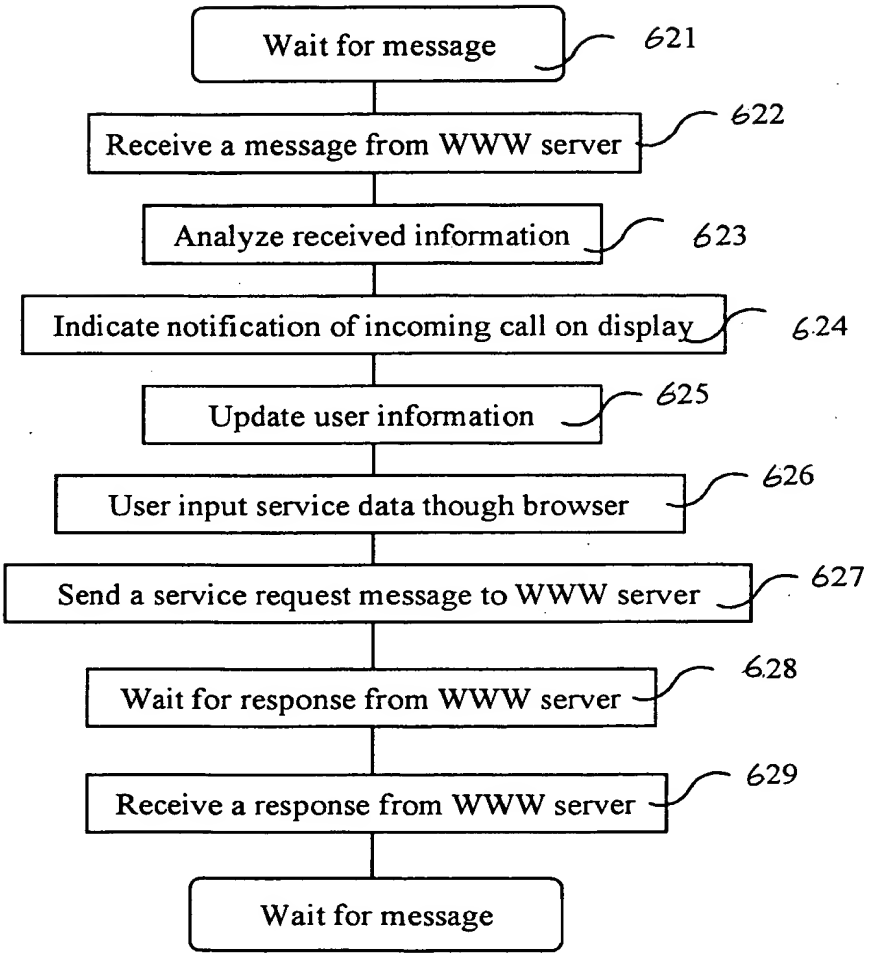

Wait for message
621
Receive a message from WWW server
622
Analyze received information
623
Indicate notification of incoming call on display
624
Update user information
625
User input service data though browser
626
Send a service request message to WWW server
627
Wait for response from WWW server
628
Receive a response from WWW server
629
Wait for message

FIG. 18

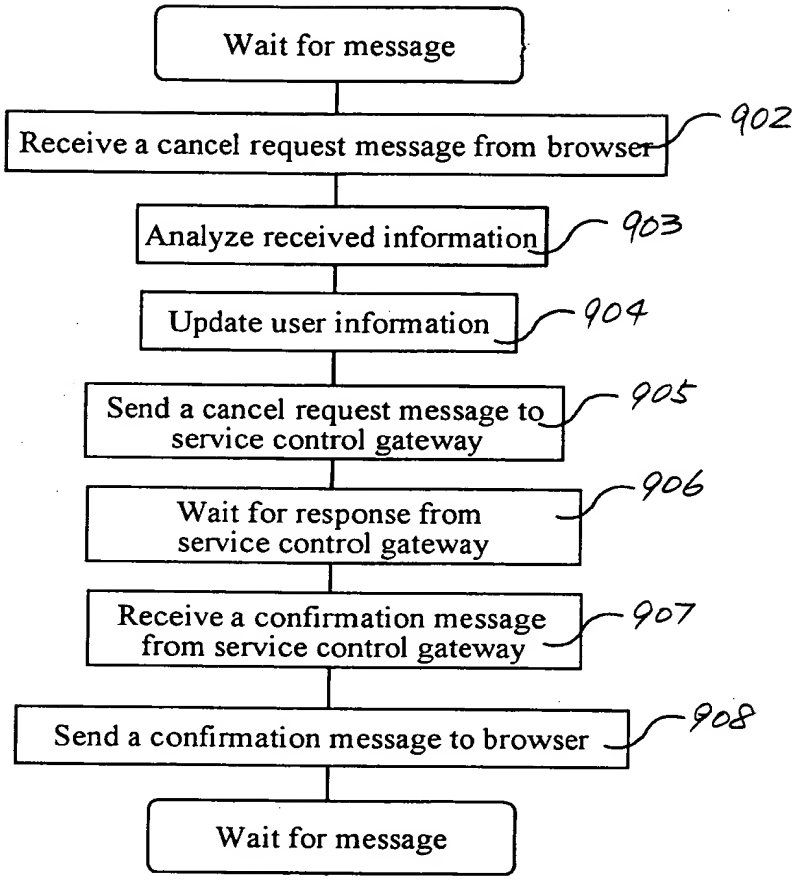

Wait for message
Receive a cancel request message from browser
902
Analyze received information
903
Update user information
904
Send a cancel request message to service control gateway
905
Wait for response from service control gateway
906
Receive a confirmation message from service control gateway
907
Send a confirmation message to browser
908
Wait for message

FIG. 19

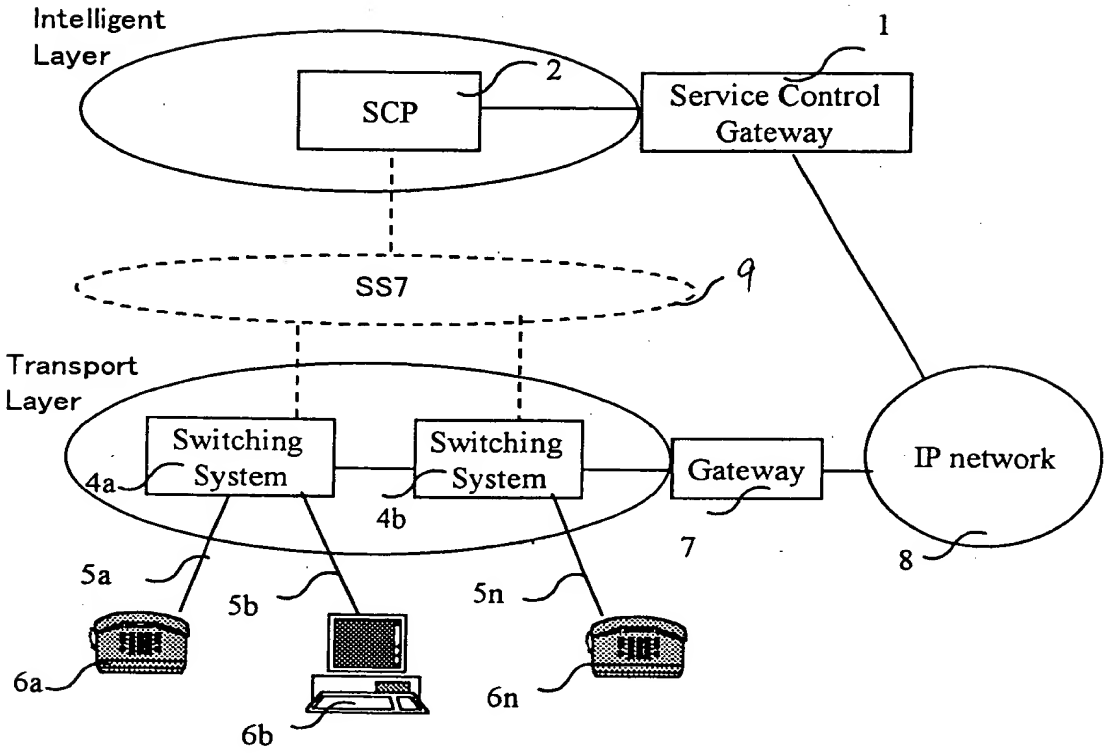

Intelligent Layer
SCP
2
Service Control Gateway
1
SS7
9
Transport Layer
Switching System
4a
Switching System
4b
Gateway
7
IP network
8
5a
5b
5n
6a
6b
6n

FIG. 20

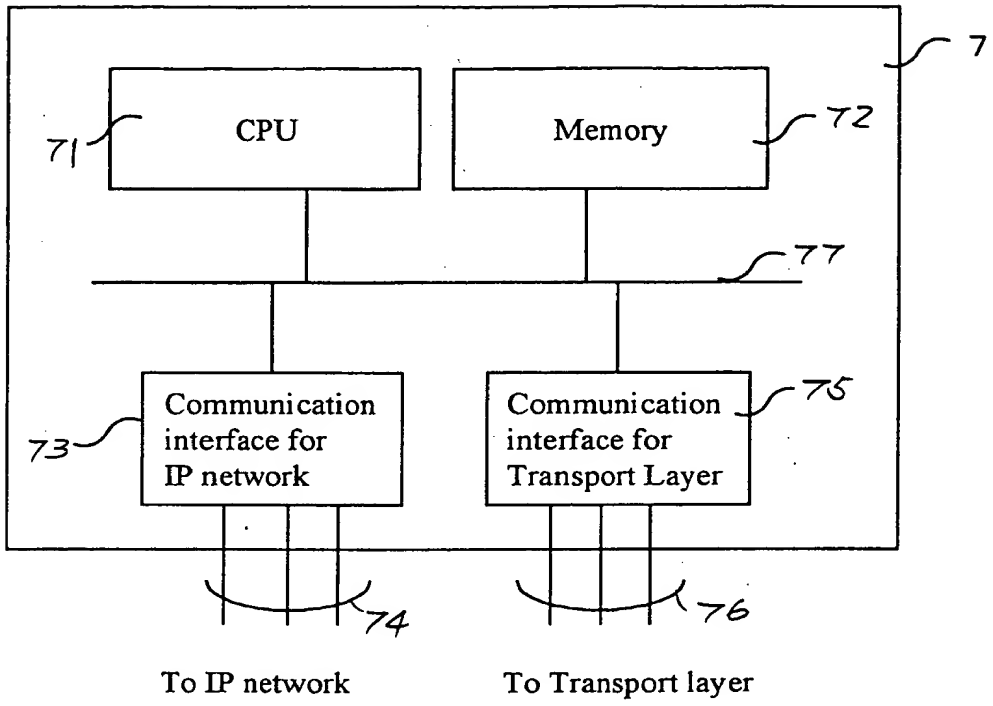

7
CPU
71
Memory
72
77
Communication interface for IP network
73
Communication interface for Transport Layer
75
74
76
To IP network
To Transport layer

FIG. 21

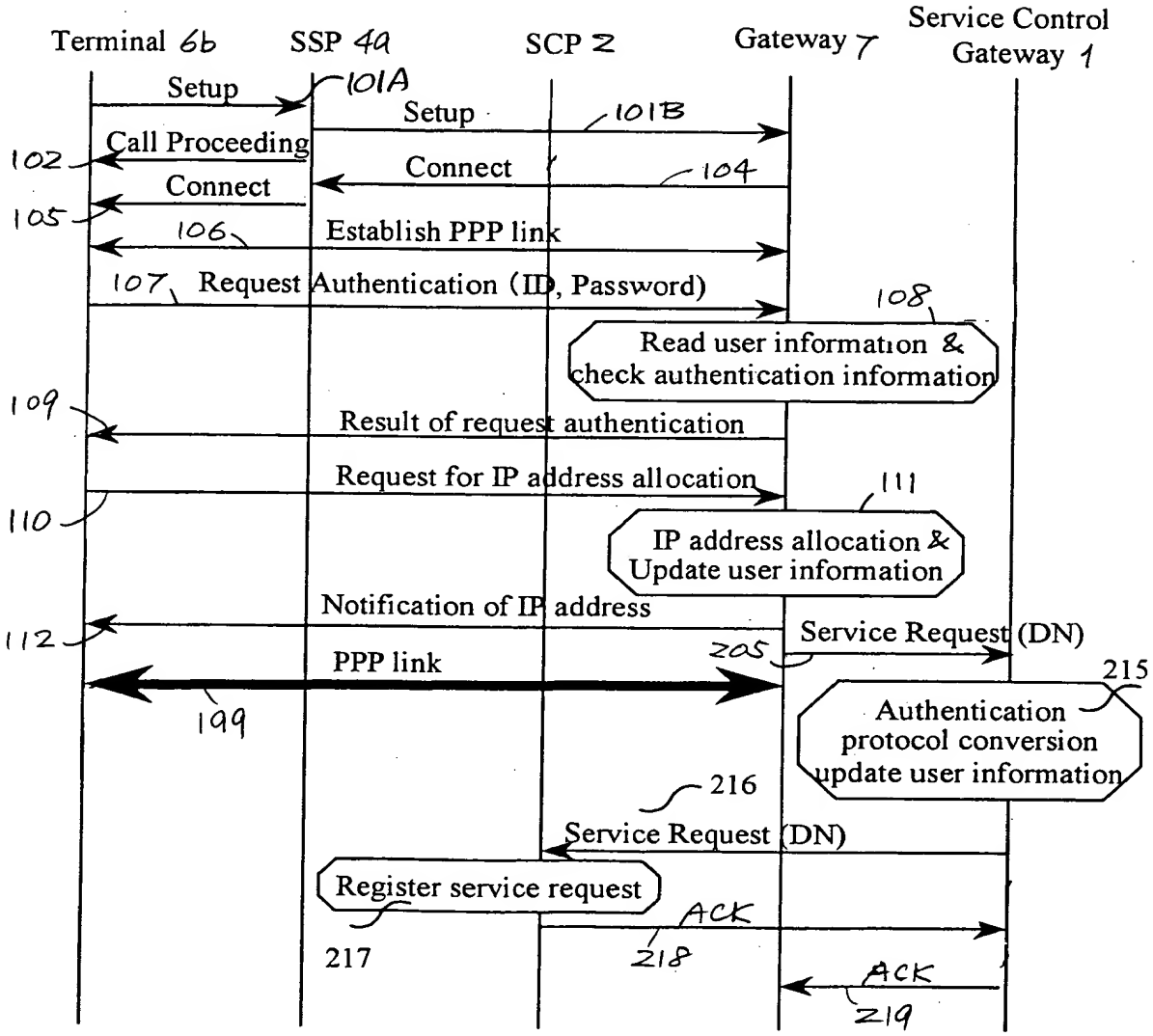

Terminal 6b
SSP 49
SCP 2
Gateway 7
Service Control Gateway 1
Setup
101A
Setup
101B
Call Proceeding
102
Connect
104
Connect
105
106
Establish PPP link
107
Request Authentication (ID, Password)
108
Read user information & check authentication information
109
Result of request authentication
Request for IP address allocation
110
111
IP address allocation & Update user information
Notification of IP address
112
Service Request (DN)
205
PPP link
199
215
Authentication protocol conversion update user information
216
Service Request (DN)
Register service request
217
ACK
218
ACK
219

FIG. 22

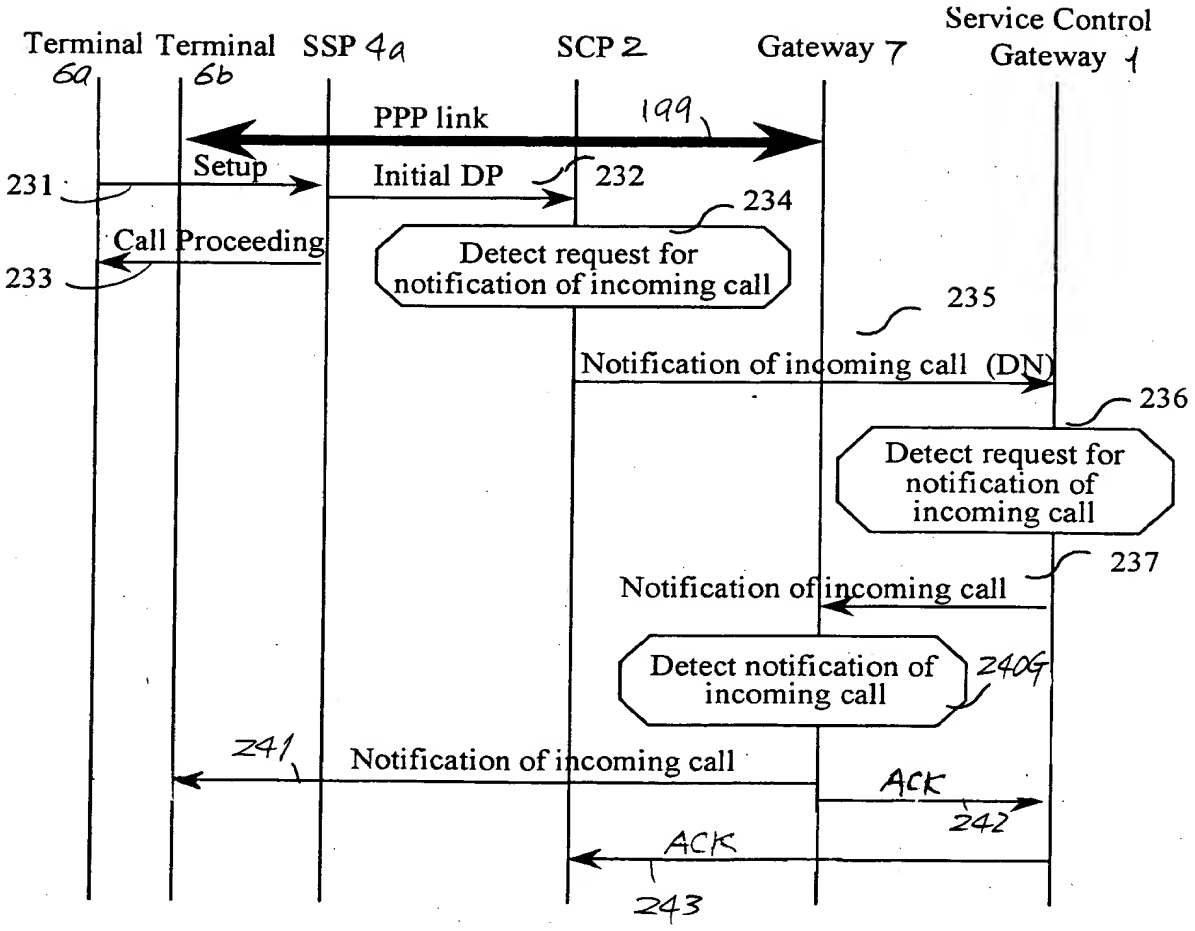

Terminal 6a
Terminal 6b
SSP 4a
SCP 2
Gateway 7
Service Control Gateway 1
PPP link
199
Setup
231
Initial DP
232
234
Call Proceeding
233
Detect request for notification of incoming call
235
Notification of incoming call (DN)
236
Detect request for notification of incoming call
237
Notification of incoming call
Detect notification of incoming call
240G
241
Notification of incoming call
ACK
242
ACK
243

FIG. 23

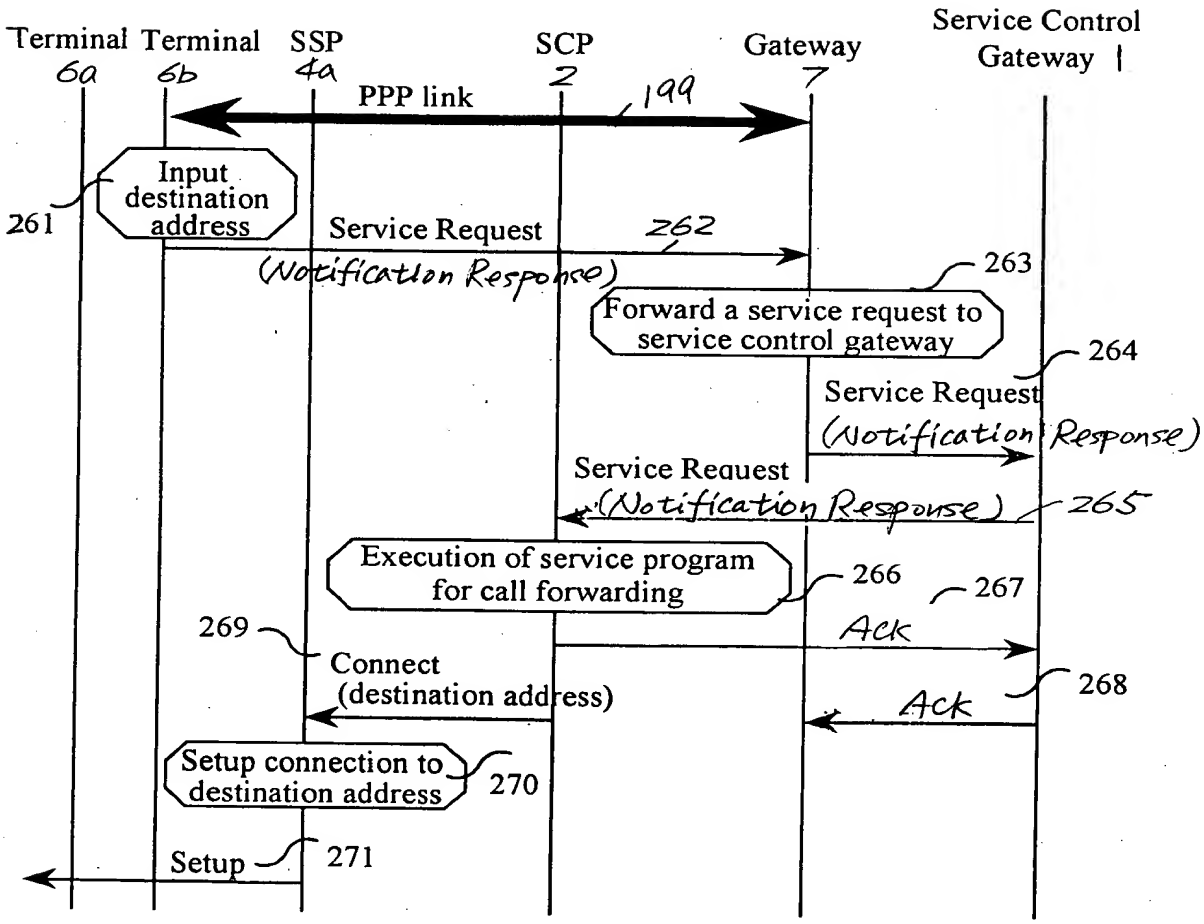

Terminal 6a
Terminal 6b
SSP 4a
SCP 2
Gateway 7
Service Control Gateway 1
PPP link
199
Input destination address
261
Service Request
(Notification Response)
262
Forward a service request to service control gateway
263
Service Request
(Notification Response)
264
Service Request
(Notification Response)
265
Execution of service program for call forwarding
266
267
Ack
269
Connect (destination address)
Ack
268
Setup connection to destination address
270
Setup
271

FIG. 24

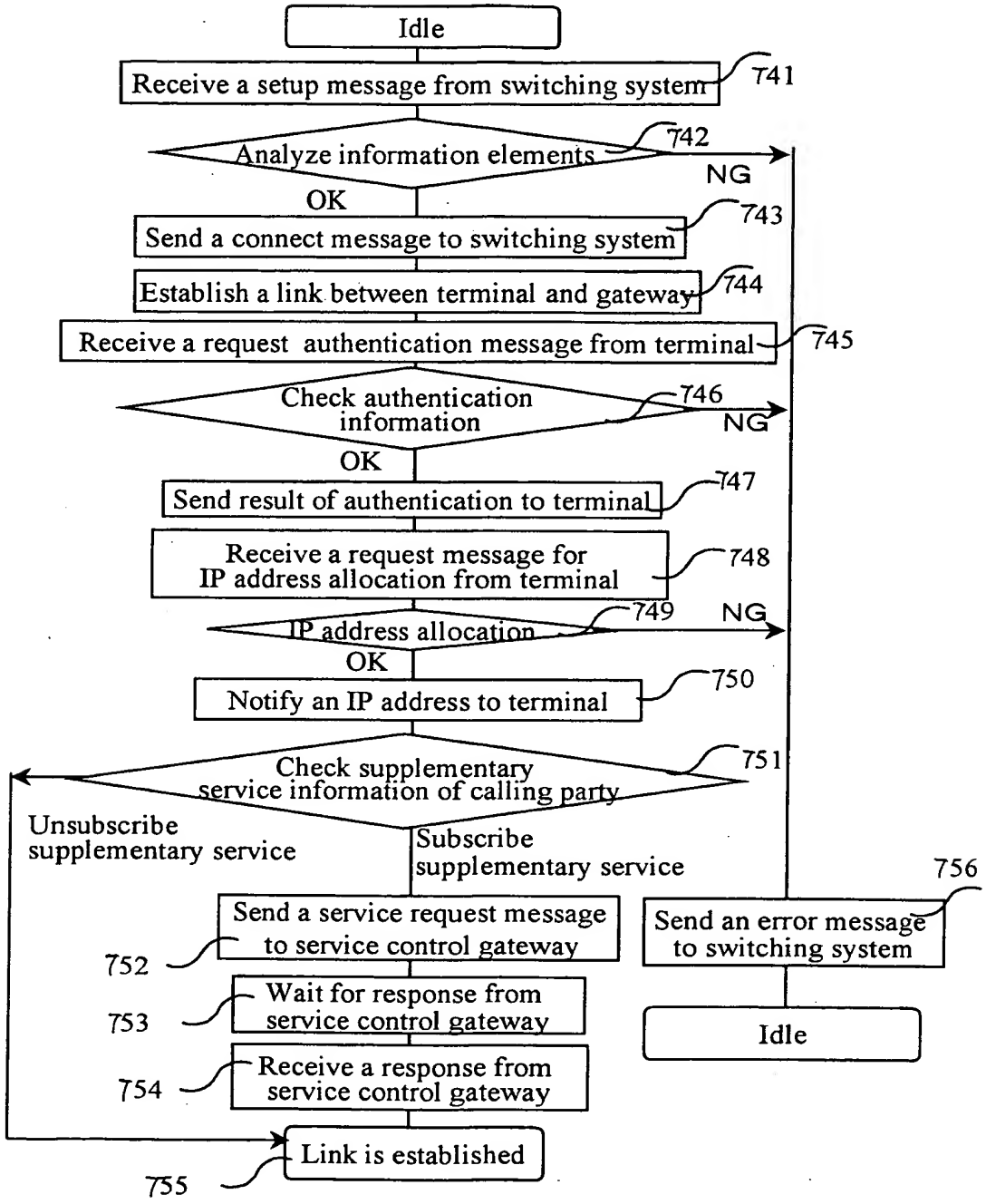

Idle
Receive a setup message from switching system
741
Analyze information elements
742
NG
OK
Send a connect message to switching system
743
Establish a link between terminal and gateway
744
Receive a request authentication message from terminal
745
Check authentication information
746
NG
OK
Send result of authentication to terminal
747
Receive a request message for IP address allocation from terminal
748
IP address allocation
749
NG
OK
Notify an IP address to terminal
750
Check supplementary service information of calling party
751
Unsubscribe supplementary service
Subscribe supplementary service
Send a service request message to service control gateway
752
Wait for response from service control gateway
753
Receive a response from service control gateway
754
Link is established
755
Send an error message to switching system
756
Idle

FIG. 25

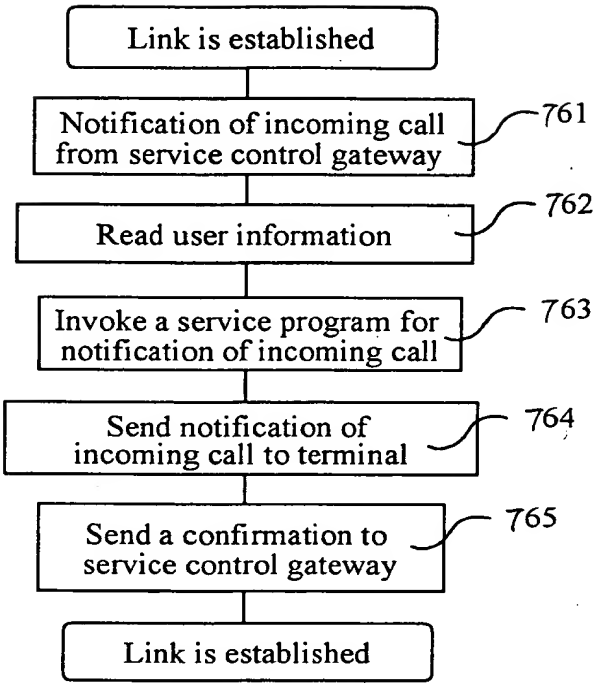

Link is established
Notification of incoming call from service control gateway
761
Read user information
762
Invoke a service program for notification of incoming call
763
Send notification of incoming call to terminal
764
Send a confirmation to service control gateway
765
Link is established

FIG. 26

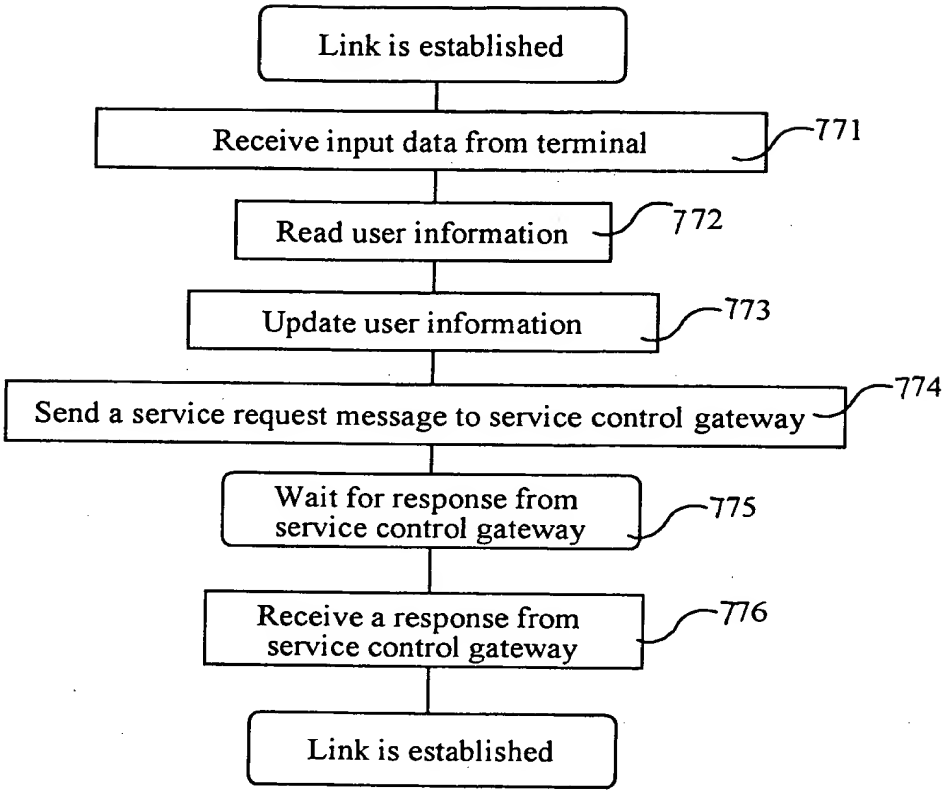
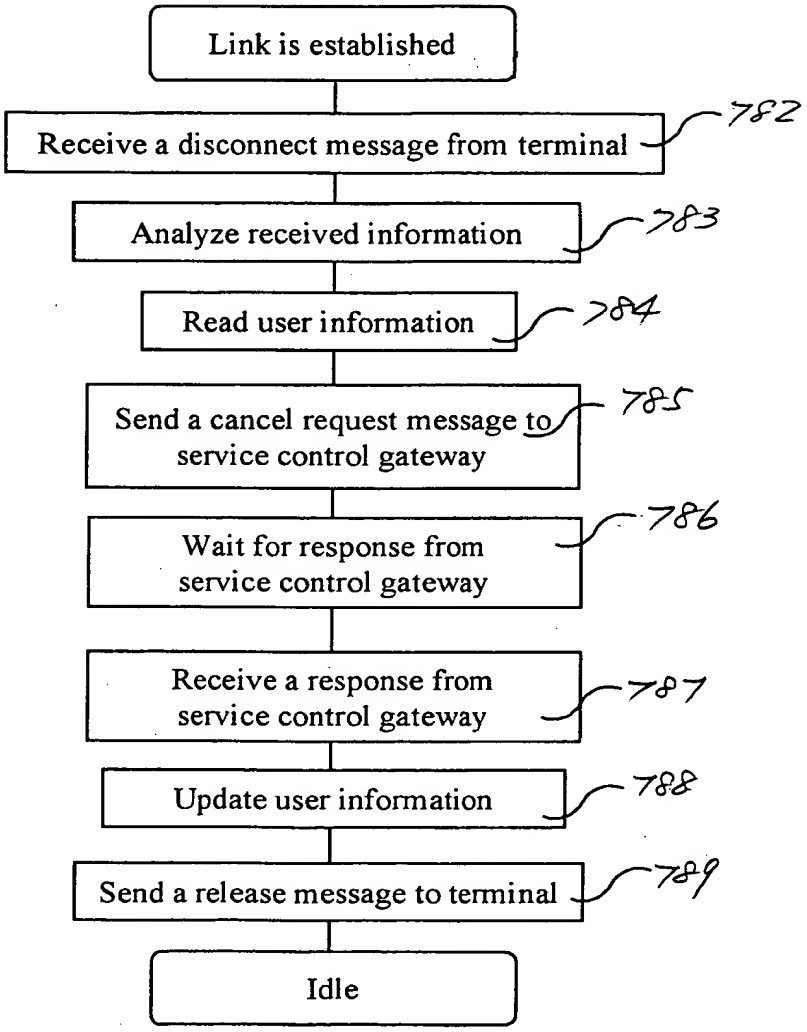

Link is established
Receive input data from terminal
771
Read user information
772
Update user information
773
Send a service request message to service control gateway
774
Wait for response from service control gateway
775
Receive a response from service control gateway
776
Link is established

FIG. 27


Link is established
Receive a disconnect message from terminal
782
Analyze received information
783
Read user information
784
Send a cancel request message to service control gateway
785
Wait for response from service control gateway
786
Receive a response from service control gateway
787
Update user information
788
Send a release message to terminal
789
Idle